

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended) A method of creating hybrid proteins having a common biological activity comprising the steps of:

(a) selecting at least five mismatched positions ~~that are mismatched~~ in a protein sequence alignment of at least two parent proteins that have 60% or greater amino acid similarity and at least one common biological activity, wherein at a mismatched position, the parent protein sequences have different amino acids;

(b) determining a minimal nucleic acid coding sequence encoding the hybrid proteins, where for each mismatched position:

the minimal nucleic acid coding sequence comprises a degenerate codon encoding an amino acid residue at the mismatched position, where the degenerate codon comprises at least one degenerate nucleotide position and the presence of the degenerate nucleotide position results in a codon that alternatively encodes the different amino acids in the parent proteins sequence at that mismatched position when the minimal encoding nucleic acid sequence is synthesized;

(~~b~~) (c) creating a library comprising 32 or more nucleic acids encoding a plurality of hybrid protein members, wherein ~~the library is created by~~ the nucleic acids comprise the minimal encoding sequences for the mismatched positions; ~~introducing a degenerate codon at the at least five mismatched positions where a degenerate codon at a mismatched position alternatively encodes at least two parent amino acid residues at each of the five mismatched positions, and wherein the parental codon that occurs at each of the five mismatched positions is independent of the parental codon that occurs at the other of the five mismatched sites;~~

(e) (d) expressing protein from at least one library member to create at least one hybrid protein; and

(d) (e) selecting at least one protein expressed from the library having a common biological activity of the parent proteins.

2. (original) The method of claim 1, wherein the parent proteins are enzymes.

3. (original) The method of claim 1, wherein the parent proteins are isozymes.

4. (original) The method of claim 1, wherein the parent proteins are polymerases.

5. (previously presented) The method of claim 1, wherein the parent proteins have greater than 80% amino acid similarity to each other and the majority of the library members have greater than 80% amino acid similarity to any of the parent proteins.

6.-16 (cancelled)

17. (previously presented) The method of claim 4, wherein the polymerases are thermostable polymerases.

18. (previously presented) The method of claim 4, wherein at least one polymerase is from *Pyrococcus furiosus*.

19. (currently amended) The method of claim 1, wherein at least twenty mismatched positions are selected ~~and degeneracies are introduced at the twenty mismatched positions.~~